Revised Fact Sheet

The U.S. Environmental Protection Agency (EPA)

Proposes to Reissue a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA) to:

City of Wrangell
Wastewater Treatment Plant

The Alaska Department of Environmental Conservation (ADEC)

Announces Notice of EPA's Request for and Proposes to Issue a Clean Water Act (CWA) § 401 Certification for the:

NPDES Permit for the City of Wrangell Wastewater Treatment Plant

Public Comment Start Date: July 28, 2023

Public Comment Expiration Date: August 28, 2023

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EPA PROPOSES TO REISSUE THE NPDES PERMIT

EPA proposes to reissue the NPDES permit for the facility referenced above. This is the second public comment period on the draft permit. As described under "Public Comment," below, EPA is only accepting comments on aspects of the revised draft permit that are

different from those in the draft permit that was issued for public comment on October 25, 2022.

This revised Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a discussion of the basis for changes made to the draft permit released for public comment in October 2022
- a listing of proposed effluent limitations and other conditions for the facility
- a map and description of the discharge location
- technical material supporting the conditions in the permit

ADEC Issues Notice of Application for and Proposal to Issue a Clean Water Act Section 401 Certification

Under CWA Section 401(a)(1), EPA may not issue a permit until the Alaska Department of Environmental Conservation (ADEC) has granted or denied certification under 40 CFR 124.55 or waived its right to certify.

EPA requested final Clean Water Act (CWA) 401 Certification from the State of Alaska for reissuance of the 301(h)-modified NDES permit for the Wrangell Wastewater Treatment Plant (WWTP) on October 25, 2022. The final certification is due on September 5, 2023.

ADEC has prepared a draft 401 Certification for public review and comment, presented in Appendix D of this revised Fact Sheet. ADEC will be accepting comment on the draft 401 Certification concurrent with the comment period on the revised draft permit. To comment or request a public hearing on the notice of application or the proposed CWA 401 Certification (see Appendix D and E), submit comments electronically to Marie Klingman at marie.klingman@alaska.gov on or before the public notice expiration date listed above.

Clean Water Act Section 401(a)(2) Review

Section 401(a)(2) of the CWA requires that, upon receipt of an application and state certification pursuant to Section 401(a)(1) of the CWA, EPA as the permitting authority, shall notify a neighboring state or tribe with Treatment as a State (TAS) when EPA determines that the discharge may affect the quality of the neighboring state/tribe's waters. 33 USC 1341(a)(2). No neighboring states or tribes with TAS will be impacted by the discharge from this facility.

Public Comment

Pursuant to 40 CFR 124.14(c), EPA is only accepting comments on those aspects of the revised draft permit that are different from those in the draft permit that was issued for public comment on October 25, 2022. Comments will not be accepted on the 301(h) tentative decision since no substantive changes have been made to the analyses or conclusions presented in the October 2022 draft.

Changes to the October 25, 2022 draft permit (2022 draft permit) are summarized below.

1. The language in the Compliance Schedule part of the Schedule of Submissions Table on page 2 of the draft permit has been simplified and now references the correct Permit Parts II.C and III.K. The redundant requirement to notify EPA of the submission of interim and final reports has been removed. This change was made in response to comments received from the City of Wrangell on the 2022 draft permit.
2. Numbers have been added to the individual compliance schedule tasks in Table 3- *Tasks Required Under the Schedule of Compliance for Bacteria.* This change was made in response to comments received from the City of Wrangell on the 2022 draft permit.
3. Influent flow monitoring has been removed; only effluent flow monitoring is required. This change was made in response to comments received from the City of Wrangell on the 2022 draft permit.
4. Per- and polyfluoroalkyl substances (PFAS) has been added to the list of effluent parameters to be monitored in Table 1 and Permit Part I.B.10. Please see Part II.B.1 of this revised Fact Sheet.
5. The final fecal coliform limits have been changed. This change was made because it is a condition of ADEC's draft 401 Certification. Comments regarding conditions of Alaska's 401 Certification, including the final fecal coliform limits in Table 1 of the revised draft permit, should be directed to ADEC (see State Certification on Page 2 of this revised Fact Sheet).
6. The final effluent limits for enterococcus have been changed. This change was made because it is a condition of ADEC's draft 401 Certification. Comments regarding conditions of Alaska's 401 Certification, including the final enterococcus limits in Table 1 of the revised draft permit, should be directed to ADEC (see State Certification on Page 2 of this revised Fact Sheet).
7. The effluent limits for ammonia in Table 1 have been corrected. This change was made due to a technical mistake in the calculation of water quality based effluent limits (WQBELs) in the 2022 draft permit.
8. Chlorine limits have been removed from the revised draft permit. Please see Part III.A.3 of this revised Fact Sheet.
9. Whole effluent toxicity (WET) monitoring has been included in Part I.C of the revised draft permit (See Part III.B of this revised Fact Sheet).
10. Daily maximum reporting requirements for copper, temperature, and silver have been added to Table 1 of the revised draft permit (See Part III.B of this revised Fact Sheet)
11. A footnote was added to Table 1 requiring enterococcus monitoring to begin within 6 months of the effective date of the permit (See Part III.B of this revised Fact Sheet).
12. The language regarding the Toxic Pollutant Scan in the footnotes of Table 1 and Permit Part II.D.1 – *Toxic Control Program, Chemical Analysis and Source Identification*, has been simplified. The required parameters are now identified in Part II.D.1 of the revised draft permit, and additional language has been added applicable to "small" 301(h) facilities.

13. Footnotes 8, 11, and 12 in Table 1 related to bacteria have been removed. This change was made because of input from ADEC during their review of the 2022 draft permit.
14. The units of measurement for fecal coliform and enterococcus in Table 1 have been corrected. The units of measurement presented in the 2022 draft permit are not consistent with Alaska WQS.
15. Language regarding the use of a thermistor for temperature monitoring has been removed from Permit Part I.B.3 and I.B.4. This template language was included by mistake.
16. The requirement to obtain approval from ADEC for the receiving water monitoring locations has been removed. This change was made because of input from ADEC during their review of the 2022 draft permit.
17. The requirement to notify ADEC of the development and implementation of the following plans and studies has been removed: Operations and Maintenance Plan (Permit Part II.A), Quality Assurance Plan (Permit Part II.B), Emergency Response and Public Notification Plan (Permit Part II.F). These changes were made because of input from ADEC during their review of the 2022 draft permit.
18. Clarifying language has been added to Permit Part I.B.2 regarding the visual observation of surface waters. Observations and logs are to be made once per month when the receiving water monitoring is conducted pursuant to Permit Part I.C. This change was made because of comments received from the City of Wrangell on the 2022 draft permit.
19. The requirement that near-shore receiving water monitoring locations be analyzed for all parameters in Table 2 of the 2022 draft permit was included in error and has been removed from Part I.C.2.d of the revised draft permit. The basis of this change can be found in Part III.B.2 of this revised Fact Sheet.

All comments on the revised draft permit or requests for a public hearing must be submitted via email to Jamey Stoddard (stoddard.jamey@epa.gov). If you are unable to submit comments via email, please call 206.553.6110.

Persons wishing to comment on or request a public hearing for the draft permit for this facility may do so in writing by the expiration date of the public comment period. A request for a public hearing must state the nature of the issues to be raised as well as the requester's name, address, and telephone number. All comments and requests for public hearings must be in writing and should be submitted to the EPA as described in the Public Comments section of the attached Public Notice.

After the Public Notice expires, and all comments on the draft permit have been considered, EPA Region 10 will make a final decision regarding 301(h) eligibility and permit issuance. If no substantive comments are received, the tentative conditions in the draft permit will become final, the tentative 301(h) decision will be finalized, and the permit will become effective upon issuance. If substantive comments are received, EPA will address the comments prior to taking final action on the 301(h) decision and permit. The permit will become effective no less than 30 days after the issuance date unless an appeal is submitted to the Environmental Appeals Board within 30 days pursuant to 40 CFR 124.19.

DOCUMENTS ARE AVAILABLE FOR REVIEW

The revised draft permit, this revised FS (which includes the 401 Certification materials), and the Public Notice can also be found by visiting the Region 10 website at https://www.epa.gov/npdes-permits/about-region-10s-npdes-permit-program.

For technical questions regarding the draft permit, this Fact Sheet, or the 301(h) TD, contact Jamey Stoddard at 206.553.6110 or stoddard.jamey@epa.gov. Services can be made available to persons with disabilities by contacting Audrey Washington at (206) 553-0523.

The draft Administrative Record for this action contains any documents listed in the References section. The Administrative Record or documents from it are available electronically upon request by contacting Jamey Stoddard

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Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
Act	Clean Water Act
AML	Average Monthly Limit
ASR	Alternative State Requirement
AWL	Average Weekly Limit
BE	Biological Evaluation
BOD_5	Biochemical oxygen demand, five-day
°C	Degrees Celsius
C BOD_5	Carbonaceous Biochemical Oxygen Demand
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EA	Environmental Assessment
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
HUC	Hydrologic Unit Code
ICIS	Integrated Compliance Information System
LA	Load Allocation
lbs/day	Pounds per day
LTA	Long Term Average
LTCP	Long Term Control Plan
mg/L	Milligrams per liter
mL	Milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
MLLW	Mean Lower Low Water
MPN	Most Probable Number
N	Nitrogen

NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
s.u.	Standard Units
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
UV	Ultraviolet
WD	Water Division
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

I. Background Information

A. General Information

General facility information was provided in the 2022 Fact Sheet.

B. Modification of Secondary Treatment Requirements

Information on the modification of secondary treatment requirements was provided in the 2022 Fact Sheet.

C. Permit History

Information on the history of the permit was provided in the 2022 Fact Sheet.

On October 25, 2022, EPA released a draft permit (2022 draft permit) and 301(h) tentative decision for the Wrangell Wastewater Treatment Plant (WWTP) for a 45-day public review and comment period. Since the initial comment period, EPA has determined that certain changes to the 2022 draft permit are necessary, as summarized in the *Public Comment* part on Page 2 of this revised Fact Sheet and described further below.

D. Tribal Consultation

Background information on tribal consultation was provided in the 2022 Fact Sheet.

The Wrangell WWTP is located within the territory of the Wrangell Cooperative Association (WCA), a federally recognized tribe. EPA notified the WCA of its work on this draft permit via electronic mail in August 2020, January 2021, and held an informational webinar for WCA and other tribes on April 14 and April 25, 2022. On October 14, 2022, EPA invited the WCA to participate in government-to-government consultation on the draft 301(h) and permitting decisions. No response was received.

EPA informed the WCA on June 1, 2023, that the 2022 draft permit has been revised and will be released for public comment, and that the invitation for formal government-to-government consultation remains open. Copies of the revised draft permit were provided to the WCA on July 28, 2023.

II. Facility and Receiving Water Information

The 2022 Fact Sheet incorrectly stated the aeration basin has a capacity of 3.5 MGD; the correct capacity of the aeration basin is 3.6 MGD. Additional facility and receiving water information was provided in the 2022 Fact Sheet. No other changes have been made.

III. Effluent Limitations and Monitoring Requirements

Effluent limitations and monitoring requirements were discussed in the 2022 Fact Sheet.

The revised draft permit includes several changes to the effluent limitations and monitoring requirements that were proposed in the 2022 draft permit. EPA is only accepting comments on aspects of the revised draft permit that differ from the 2022 draft.

A summary of the changes and their basis is provided in Table 1 below.

Table 1. Summary of Changes to 2022 Draft Permit

Parameter	Effluent Limit or Monitoring Change and Location	Basis Summary
Fecal Coliform	Change: More stringent limits Location: Table 1 of revised draft permit	The revised draft permit contains fecal coliform limitations specified by ADEC as a condition of the draft 401 Certification. Comments regarding conditions of Alaska's 401 Certification, including the fecal coliform limits in Table 1 of the revised draft permit, should be directed to ADEC (see State Certification on Page 2 of this revised Fact Sheet). EPA will accept comment on the calculated WQBELs presented in Part III.A.3 of this revised Fact Sheet.
Enterococcus	Change: More stringent limits and requirement to begin monitoring within 6 months of the effective date of the permit. Location: Table 1 of revised draft permit	The revised draft permit contains enterococcus limitations specified by ADEC as a condition of the draft 401 Certification. Comments regarding conditions of Alaska's 401 Certification, including the enterococcus limits in Table 1 of the revised draft permit, should be directed to ADEC (see State Certification on Page 2 of this revised Fact Sheet). EPA will accept comment on the calculated WQBELs presented in Part III.A.3 of this revised Fact Sheet. The revised draft permit includes a footnote in Table 1 that requires the Permittee to begin monitoring the effluent for enterococcus bacteria within 6 months of the effective date of the permit. This will provide data on the concentrations of enterococcus bacteria in the discharge as the facility begins the planning process for achieving the final effluent limitations.
Total Residual Chlorine	Change: Limits have been removed Location: Table 1 of revised draft permit	Wrangell did not include the use of chlorine in its permit application and confirmed that chlorine is not currently used at the facility. Since the Wrangell WWTP does not use chlorine, EPA is no longer proposing a limit in the revised draft permit. If the facility begins to use chlorine it is required to notify EPA pursuant to Permit Parts III.J and IV.I so that EPA can determine whether to modify the permit to include chlorine limits. Until that time, the permit does not authorize the discharge of chlorine. For additional information see Part III.A.3 of this revised Fact Sheet.
Total Ammonia (as N)	Change: Corrected limits Location: Table 1 of revised draft permit	A technical mistake resulted in incorrect WQBELs for total ammonia in the 2022 draft permit. Corrected WQBELs for total ammonia are included in Table 1 of the revised draft permit.

Flow Monitoring	Change: Influent flow monitoring requirement removed Location: Table 1 of revised draft permit	The requirement to monitor influent flow has been removed from Table 1 of the revised draft permit. Effluent monitoring is sufficient for representative monitoring of facility flow.
Temperature	Change: Removed language regarding the use of a thermistor for monitoring and included a maximum daily reporting requirement. Location: Part I.B.3 and I.B.4 of the 2022 draft permit and Table 1 of the revised draft permit	Both the 2002 permit and the 2022 draft permit require grab sampling once per week for temperature in Table 1. The language regarding the use of a thermistor was accidentally included from template language and has been removed from the revised draft permit. Daily maximum reporting for temperature was inadvertently omitted from Table 1 of the 2022 draft permit; the revised draft permit includes a daily maximum reporting requirement for temperature. Monitoring and reporting the daily maximum are standard practice for most monitored parameters in NPDES permits, including temperature.
Copper	Change: A maximum daily reporting requirement has been added to the revised draft permit Location: Table 1 of the revised draft permit.	Daily maximum reporting for copper was inadvertently omitted from Table 1 of the 2022 draft permit. Monitoring and reporting the daily maximum are standard practice for most monitored parameters in NPDES permits, including copper.
Silver	Change: A maximum daily reporting requirement has been added to the revised draft permit Location: Table 1 of the revised draft permit.	Daily maximum reporting for silver was inadvertently omitted from Table 1 of the 2022 draft permit. Monitoring and reporting the daily maximum are standard practice for most monitored parameters in NPDES permits, including silver.
Whole Effluent Toxicity (WET) Monitoring	Change: WET monitoring requirements have been included in the revised draft permit Table 1 and Part I.C of the revised draft permit	Alaska WQS at 18 AAC 70.030 require that an effluent discharged to a waterbody may not impart chronic toxicity to aquatic organisms, expressed as 1.0 chronic toxic unit (TUc), at the point of discharge, or if the Department authorizes a mixing zone in a permit, approval, or certification, at or beyond the mixing zone boundary, based on the minimum effluent dilution achieved in the mixing

	Location: Table 1 and Permit Part I.C.	zone. The 2002 permit did not include WET monitoring requirements and so the relative toxicity of the discharge cannot be assessed. EPA is including WET monitoring requirements in the Part I.C of the revised draft permit to assess and characterize the toxicity of the discharge.
PFAS	Change: New effluent monitoring requirements Location: Table 1 of revised draft permit	PFAS are widespread and persistent in the environment. The draft permit requires monitoring to determine if the effluent contains PFAS. See Section III.B.1.
Bacteria Footnotes	Change/Location: Footnotes 8, 11, and 12 related to bacteria limits have been remove from Table 1 of the revised draft permit	This change was made because of input from ADEC during their review of the 2022 draft permit.
Narrative limitations for floating, suspended, or submerged matter	Change: Visual observations and logs must be taken monthly during annual receiving water monitoring Location: Permit Part I.B.2.b	The City of Wrangell submitted a comment on the 2022 draft permit requesting additional clarification of the visual observation requirements associated with the narrative limitations for floating, suspended, or submerged matter in Permit Part I.B.2.b. The 2022 draft permit did not specify the frequency or timing of this monitoring. Clarifying language has been added to Permit Part I.B.2.b.
Nearshore Receiving Water Monitoring	Change: Reduction in the number of parameters required to be analyzed at nearshore monitoring locations Location: Permit Part I.C.2.d	The number of parameters that must be analyzed at nearshore receiving water monitoring locations has been reduced in Part I.C.2.d of the revised draft permit. The basis of this change can be found in Part III.B.2 of this revised Fact Sheet.

A. Basis for Effluent Limits

The basis for effluent limits was discussed in the 2022 Fact Sheet.

1. Pollutants of Concern

Pollutants of concern were discussed in the 2022 Fact Sheet.

2. Technology-Based Effluent Limits (TBELs)

TBELs applicable to this facility were discussed in the 2022 Fact Sheet. No changes have been made to TBELs in the revised draft permit and comments will not be accepted.

3. Water Quality-Based Effluent Limits (WQBELs)

Statutory and Regulatory Basis

The statutory and regulatory basis of WQBELs was provided in the 2022 Fact Sheet.

Reasonable Potential Analysis and Need for WQBELs

The WQBELs for ammonia, fecal coliform, and enterococcus have changed since the 2022 draft permit. The revised draft permit contains WQBELs for chlorine, ammonia, and enterococcus that are based on the dilution factors provided by ADEC in their draft 401 Certification (see Appendix D). Since chlorine is not used at the facility and the facility did not include chlorine in the NPDES permit application, EPA has removed chlorine limits from the revised draft permit.

Table 3. Mixing Zones

Criteria Type	Dilution Factor
Acute Aquatic Life	4.5
Chronic Aquatic Life	33

If ADEC revises these mixing zones in its final 401 Certification, the reasonable potential analysis and WQBEL calculations will be revised accordingly for the final permit.

Chlorine

Chlorine limits have been removed from the revised draft permit. The Wrangell WWTP does not currently provide disinfection of its effluent but will need to in order to achieve the final bacteria limits in the revised draft permit. In addition, Wrangell did not include the use of chlorine in its permit application and confirmed it is not currently being used at the facility. Since the Wrangell WWTP does not use chlorine, EPA is not including a limit for chlorine in the revised draft permit. If the facility begins to use chlorine it will need to notify EPA pursuant to Permit Parts III.J and IV.I so that EPA can determine whether to modify the permit to include chlorine limits. Until that time, the permit does not authorize the discharge of chlorine.

Removing chlorine as a permitted discharge in the revised draft permit will make it more stringent than the 2002 permit which authorized the discharge of chlorine. Therefore, no backsliding is occuring under Section 402(o) of the CWA and 40 CFR 122.44(l).

Comments will be accepted on the removal of chlorine limits from the revised draft permit.

Ammonia

The ammonia limits presented in the 2022 draft permit were inadvertently calculated using the wrong dilution factors, resulting in incorrect effluent limits. Corrected WQBELs for ammonia have been calculated using Alaska's WQS and the dilution factors provided by ADEC in their draft 401 Certification. See Appendix C for the corrected calculations.

Comments will be accepted on the corrected ammonia limits in Table 1 of the revised draft permit.

Fecal Coliform

The 2022 draft permit included final WQBELs for fecal coliform calculated using Alaska's WQS and the dilution achieved after initial mixing at the boundary of the ZID.

ADEC has included the following final fecal coliform limits as a condition of the draft 401 Certification. EPA has included these final fecal coliform limits in the revised draft permit pursuant to CWA section 401(d). Note: these are the fecal coliform limits that will come into effect at the end of the compliance schedule for bacteria; the interim limits have not changed since the 2022 draft permit.

Table 4. Final Fecal Coliform Limits

Average Monthly (FC/100 mL)	*Average Weekly (FC/100 mL)*	*Max Daily (FC/100 mL)*
*200**	*400**	*800*
**18 AAC 72.990(21)*		

Comments on the conditions of the draft 401 Certification, including the final fecal coliform limits presented in Table 4 above, should be directed to ADEC (see State Certification on Page 2 of this revised Fact Sheet).

If ADEC does not require these final fecal coliform limits as a condition of the final 401 Certification, the WQBELs presented below using the chronic mixing zone dilution will become the final fecal coliform limits. Comments will be accepted on the final WQBELs for fecal coliform presented below.

Maximum Daily Limit = 33 x 43 = 1,419 FC/100mL

Average Monthly Limit = 33 x 14 = 462 FC/100mL

Enterococcus

The 2022 draft permit included final WQBELs for enterococcus calculated using Alaska's WQS and the dilution achieved after initial mixing at the boundary of the ZID.

As a condition of 401 Certification, ADEC is requiring the following final enterococcus limits based on the dilution achieved at the boundary of the chronic mixing zone (33:1). EPA has included these enterococcus coliform limits in the revised draft permit pursuant to CWA section 401(d).

Maximum Daily Limit = 33 x 130 = 4,290 CFU/100mL

Average Monthly Limit = 33 x 35 = 1,115 CFU/100mL

Table 5. Final Enterococcus Limits

Average Monthly (FC/100 mL)	*Max Daily (FC/100 mL)*
1,155	*4,290*

These WQBELs are more stringent than the limits calculated using the ZID dilution and have been incorporated into the draft permit.

The WQBELs developed for enterococcus will be protective of Alaska WQS at the boundary of the chronic mixing zone and will satisfy the requirements of CWA section 301(h)(9) and 40 CFR 125.62(a). If ADEC does not include these limits as a condition of 401 certification the limits proposed in the 2022 draft will be used.

Comments on the conditions of the draft 401 Certification, including the final enterococcus limits presented in Table 5 above, should be directed to ADEC (see State Certification on Page 2 of this revised Fact Sheet).

B. Monitoring Requirements

1. Effluent Monitoring

Background information on effluent monitoring was provided in the 2022 Fact Sheet.

Three changes to the effluent monitoring requirement have been made since the 2022 draft permit and are summarized below.

<u>Copper</u>

Daily maximum reporting for copper was inadvertently omitted from Table 1 of the 2022 draft permit; the revised draft permit includes a daily maximum reporting requirement for copper. Monitoring and reporting the daily maximum are standard practice for most monitored parameters in NPDES permits, including copper.

Comments will be accepted on the inclusion of a daily maximum reporting requirement for copper in Table 1 of the revised draft permit.

<u>Temperature</u>

The 2022 draft permit included language in Part I.B.3 and I.B.4 requiring the use of a thermistor. Use of a thermistor is only required when continuous temperature monitoring is necessary. Continuous temperature monitoring is only necessary when

there is reasonable potential for temperature to cause or contribute to an excursion of the State's temperature criteria. As discussed in Part IV.3. of the 2022 Fact Sheet, the discharge does not have reasonable potential for temperature. In addition, both the 2002 permit and the 2022 draft permit require grab sampling once per week for temperature in Table 1. Thus, the language regarding the use of a thermistor was accidentally included from template language and has been removed from the revised draft permit.

Daily maximum reporting for temperature was inadvertently omitted from Table 1 of the 2022 draft permit; the revised draft permit includes a daily maximum reporting requirement for temperature. Monitoring and reporting the daily maximum are standard practice for most monitored parameters in NPDES permits, including temperature.

Comments will be accepted on the removal of the thermistor language from Permit Part I.B.3 and I.B.4 and the inclusion of a daily maximum reporting requirements for temperature in Table 1 of the revised draft permit.

Flow

The 2022 draft permit required both influent and effluent flow monitoring. EPA does not believe it is necessary for the facility to conduct influent flow monitoring, thus, influent flow monitoring has been removed from Table 1 of the revised draft permit.

Comments will be accepted on the removal of influent monitoring from the revised draft permit.

Silver

Daily maximum reporting for silver was inadvertently omitted from Table 1 of the 2022 draft permit; the revised draft permit includes a daily maximum reporting requirement for silver. Monitoring and reporting the daily maximum are standard practice for most monitored parameters in NPDES permits, including silver.

Comments will be accepted on the inclusion of a daily maximum reporting requirement for silver.

Whole Effluent Toxicity (WET)

EPA and individual States implement three approaches to protect water quality. These approaches include chemical-specific control, toxicity testing control (i.e., whole effluent toxicity testing), and biological criteria/bioassessments (EPA 1991).

WET requirements in NPDES permits protect aquatic life from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. The end point and results of WET tests are typically reported in acute and chronic toxic units, TUa and TUc, respectively. The TUa and TUc test results are treated the same as other reported permit parameters and used in the same manner in the TSD calculations for determining reasonable potential and establishing WQBELs for WET.

Alaska WQS at 18 AAC 70.030 require that an effluent discharged to a waterbody may not impart chronic toxicity to aquatic organisms, expressed as 1.0 chronic toxic unit (TUc), at the point of discharge, or if the Department authorizes a mixing zone in a permit, approval, or certification, at or beyond the mixing zone boundary, based on the minimum effluent dilution achieved in the mixing zone. 18 AAC 83.435 requires that a permit contain limitations on WET when a discharge has reasonable potential to cause or contribute to an exceedance of a WQS.

The 2002 permit did not include WET monitoring requirements and so the relative toxicity of the discharge cannot be assessed. EPA is including WET monitoring requirements in the Part I.C of the revised draft permit to assess and characterize the toxicity of the discharge.

Comments will be accepted on the WET monitoring requirements in Part I.C of the revised draft permit.

Enterococcus

The 2002 draft permit did not specify when enterococcus monitoring must begin. The revised draft permit requires enterococcus monitoring to begin within 6 months of the effective date of the permit (see Table 1, Footnote 10). This will provide EPA, ADEC, and the applicant to obtain data regarding enterococcus concentrations in the discharge as planning begins for achieving the final limits.

Comments will be accepted on the requirement that enterococcus monitoring begin within 6 months after the effective date of the permit.

PFAS Monitoring

Per- and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been in use since the 1940s. PFAS are found in a wide array of consumer and industrial products. Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS. Discharges of PFAS above certain levels may cause adverse effects to human health or aquatic life.2F ,3F

Since PFAS chemicals are persistent in the environment and may lead to adverse human health and environmental effects, the draft permit requires that the permittee conduct twice yearly influent, effluent, and sludge sampling for PFAS chemicals. The monitoring requirements for PFAS chemicals are deferred until the third and fourth years of the permit term (beginning during the first complete quarter of the third year). This will give the permittee time to plan for this new monitoring requirement (e.g., to obtain funding, train employees, and find a suitable contract laboratory).

The draft permit also requires that the permittee either submit a certification meeting the requirements of 40 CFR 125.66(a)(2) that there are no industrial users and documents the certification with an industrial user survey as described by 40 CFR 403.8(f)(2) or inventory the industrial users (IUs) of the treatment works, to identify IUs of the POTW that may discharge pollutants, including PFAS chemicals, to the

collection system. Industry sectors known or suspected to discharge PFAS include, but are not limited to, organic chemicals, plastics & synthetic fibers (OCPSF); metal finishing; electroplating; electric and electronic components; landfills; pulp, paper & paperboard; leather tanning & finishing; plastics molding & forming; textile mills; paint formulating, and airports.4F ,5F EPA's website has public databases such as Enforcement and Compliance History Online (ECHO) (https://echo.epa.gov/) and Envirofacts (https://enviro.epa.gov/) which may be useful in identifying such industrial users.

If PFAS chemicals are detected in the influent, effluent, or sludge in the first year of sampling, then the permittee must sample any IUs identified as potential PFAS sources at least once during the following calendar year.

The purpose of these monitoring and reporting requirements is to better understand potential discharges of PFAS from this facility and to inform future permitting decisions, including the potential development of water quality-based effluent limits. EPA is authorized to require this monitoring and reporting by CWA section 308(a). The permit conditions reflect EPA's commitments in the PFAS Strategic Roadmap, which directs the Office of Water to leverage NPDES permits to reduce PFAS discharges to waterways "at the source and obtain more comprehensive information through monitoring on the sources of PFAS and quantity of PFAS discharged by these sources."

There is currently no analytical method approved in 40 CFR Part 136 for PFAS. As stated in 40 CFR 122.44(i)(1)(iv)(B), in the case of pollutants or pollutant parameters for which there are no approved methods under 40 CFR Part 136 or methods are not otherwise required under 40 CFR chapter I, subchapter N or O, monitoring shall be conducted according to a test procedure specified in the permit for such pollutants or pollutant parameters. Therefore, the Permit specifies that until there is an analytical method approved in 40 CFR Part 136 for PFAS, monitoring shall be conducted using Draft Method 1633.

Comments will be accepted on the PFAS monitoring requirements in the revised draft permit.

2. Receiving Water Monitoring

Background information on receiving water monitoring was provided in the 2022 Fact Sheet.

Two changes to the receiving water monitoring requirements have been made since the 2022 draft permit and are summarized below.

Part I.C.2.d of the 2022 draft permit required that samples taken at the nearshore receiving water monitoring locations be analyzed for all parameters identified in Table 2 of the 2022 draft permit; this was an error. The purpose of the nearshore receiving water sampling locations in the 2002 permit as well as the 2022 draft was to monitor

the nearshore environment for bacterial indicator organisms that may pose a threat to human health, so the number of parameters necessary for analysis is limited to temperature and bacterial indicator organisms. The requirement to analyze nearshore samples for all the parameters in Table 2 of the revised draft permit has been removed from Permit Part I.C.2.d; enterococcus, fecal coliform, and temperature are the only parameters required to be monitored at the nearshore receiving water monitoring locations in the revised draft permit.

In addition, the requirement for ADEC to approve the locations of the receiving water monitoring stations has been removed from Part I.C of the revised draft permit. This change was made because of input received from ADEC during their review of the 2022 draft permit.

Comments will be accepted on these two changes to the receiving water monitoring requirements.

3. Biological Monitoring

Biological monitoring requirements were discussed in the 2022 Fact Sheet; no changes have been made to this part of the revised draft permit and comments will not be accepted.

4. Electronic Submission of Discharge Monitoring Reports

Electronic submission of discharge monitoring reports was discussed in the 2022 Fact Sheet; no changed have been made to this part of revised draft permit and comments will not be accepted.

C. Sludge (Biosolids) Requirements

Sludge requirements were discussed in the 2022 Fact Sheet; no changes have been made to this part of the revised draft permit and comments will not be accepted.

IV. Other Permit Conditions

A. Toxics Control Program

1. Chemical Analysis and Source Identification – Toxic Pollutants and Pesticides

The 301(h) regulations at 40 CFR 125.66(a) require applicants to submit at the time of application an analysis of their effluent for the toxic substances identified in 40 CFR 401.15 and the pesticides demeton, guthion, malathion, mirex, methoxychlor, and parathion (40 CFR 125.58(p)). In addition, pursuant to 40 CFR 125.66(b), the Permittee must provide an analysis of the known or suspected sources of any detected parameters.

The chemical analysis and source identification requirements in Part II.D.1 of the 2022 draft permit required the Permittee to analyze their effluent for the parameters in 40 CFR 401.15, but incorrectly omitted the CWA section 301(h) regulatory requirement to also analyze samples for the pesticides identified in 40 CFR 125.58(p).

The pesticides in 40 CFR 125.58(p) have been added to the list of parameters that must be analyzed as part of the effluent chemical analysis in Part II.D.1 of the revised draft permit. Additionally, to provide more clarity regarding the specific parameters the effluent must be tested for, Part II.D.1 of the revised draft permit has replaced the reference to the 40 CFR 401.15 parameters with the requirement that the Permittee must analyze the effluent for all parameters identified in NPDES Application Form 2A, Table C, as well as the parameters identified in Table 4 of the revised draft permit. The basis for these changes is discussed below.

The parameters identified in 40 CFR 401.15 comprise the original Toxic Pollutant List first developed in 1976. This list consisted of broad categories of pollutants rather than specific, individual pollutants. Therefore, EPA developed the Priority Pollutant List in 1977 to make implementation of the Toxic Pollutant List more practical for water testing and regulatory purposes. The majority of the Priority Pollutant List was later adopted into Table C of NPDES Application Form 2A - *Effluent Parameters for Selected POTWs* and contains nearly all the parameters identified in 40 CFR 401.15 aside from asbestos, the DDT metabolite DDE, and 2,3,7,8 – TCDD.

To satisfy 40 CFR 125.66(a), the revised draft permit requires the Permittee to sample for pesticides, the parameters identified in Table C of NPDES Application Form 2A, as well as the parameters identified in Table 4 of the revised draft permit. Table 4 consists of the three remaining 301(h) pollutants not covered by Form 2A Table C (asbestos, DDE, and 2,3,7,8 – TCDD), as well as the pollutants with applicable numeric water quality criteria that are not listed in Table B or C of Form 2A. Combined, these monitoring requirements satisfy the requirements of 40 CFR 125.66(a). These requirements are included in Part II.D.1 of the revised draft permit.

Pursuant to 40 CFR 125.66(b), as a “small” 301(h) facility (40 CFR 125.58(c)), unless required by ADEC, the requirements of Permit Parts II.D.1.a and II.D.1.b shall not apply if the Permittee certifies that there are no known or suspected sources of toxic pollutants or pesticides and documents the certification with an industrial user survey as described by 40 CFR 403.8(f)(2). This language has been added to Part II.D.1.d of the revised draft permit.

Comments will be accepted on the changes to the chemical analysis and source identification requirements of the revised draft permit discussed above.

2. Industrial Waste Management

Industrial waste management was discussed in the 2022 Fact Sheet; no changes have been made to this part of the revised draft permit and comments will not be accepted.

3. Non-industrial Source Control Program

Non-industrial source control was discussed in the 2022 Fact Sheet; no changes have been made to this part of the revised draft permit and comments will not be accepted.

B. Interim Beach Advisory

Interim beach advisory requirements were discussed in the 2022 Fact Sheet; no changes have been made to this part of the revised draft permit and comments will not be accepted.

C. Compliance Schedules

Compliance schedules are authorized by federal NPDES regulations at 40 CFR 122.47 and Alaska WQS at 18 AAC 70.910. Compliance schedules are typically authorized by states in their 401 certification of a permit and allow a discharger to phase in, over time, compliance with WQBELs when limitations are in the permit for the first time.

ADEC has authorized a 5-year schedule of compliance for bacteria in its draft 401 Certification and those requirements have been included in Permit Part II.C.

The only changes to the compliance schedule requirements that were in the 2022 draft permit are related to reporting:

- The compliance schedule part of the Schedule of Submissions Table on page 2 of the draft permit has been simplified and now references the correct Permit Parts II.C and III.K;
- The redundant reporting requirement that required the Permittee to notify EPA of the submission of interim and final reports from Permit Part III.K. and the schedule of submissions Table on page 2 of the revised draft permit has been removed. The Permittee is not required to provide an additional notification that a report has been submitted in the revised draft permit; submission of the report itself will suffice.
- Numbers have been added to the individual compliance schedule tasks in Table 3 of the revised draft permit.

Comments on the conditions of the draft 401 Certification, including the bacteria schedule of compliance, should be directed to ADEC (see State Certification on Page 2 of this revised Fact Sheet).

D. Operation and Maintenance Plan and Quality Assurance Plan

The requirements of the operation and maintenance and quality assurance plans were discussed in the 2022 Fact Sheet. The requirement to notify ADEC of the development and implementation of these two plans has been removed from Part II.A and II.B of the revised draft permit. This change was made as a result of input from ADEC during their review of the 2022 draft permit.

Comments will be accepted on these changes.

E. Sanitary Sewer Overflows and Proper Operation and Maintenance of the Collection

System

Sanitary Sewer Overflows (SSOs) and operation and maintenance requirements were discussed in the 2022 Fact Sheet; no changed have been made to this part of the revised draft permit and comments will not be accepted.

F. Environmental Justice

Environmental justice was discussed in the 2022 Fact Sheet; no changes have been made to this part of the revised draft permit and comments will not be accepted.

G. Standard Permit Provisions

Standard permit provisions were discussed in the 2022 Fact Sheet; no changes have been made to this part of the revised draft permit and comments will not be accepted.

V. Other Legal Requirements

A. Endangered Species Act

A discussion of endangered species was provided in the 2022 Fact Sheet; no changes have been made to this part of the revised draft permit and comments will not be accepted.

B. Essential Fish Habitat

A discussion of essential fish habitat was provided in the 2022 Fact Sheet; no changes have been made to this part of the revised draft permit and comments will not be accepted.

C. CWA Section 401 State Certification

Section 401 of the CWA requires the state in which the discharge originates to certify that the discharge complies with the appropriate sections of the CWA, as well as any appropriate requirements of state law. See 33 USC 1341(d). As a result of the certification, the state may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with WQS, or treatment standards established pursuant to any state law or regulation.

EPA held preliminary discussions with ADEC regarding its CWA Section 401 Certification during development of the draft permit. One June 2, 2022, EPA sent ADEC a pre-filing certification meeting request. On October 25, 2022, EPA requested that final 401 Certification of the 2022 draft permit from ADEC. On December 20, 2022, EPA received and granted a request to extend the deadline for ADEC to provide final 401 Certification for 180 days. On May 2, 2023, EPA received and granted another request to extend the deadline for ADEC to provide final 401 Certification for an additional 120 days. On July 27, 2023, ADEC provided EPA with a draft 401 Certification.

ADEC will be accepting public comments on the draft 401 Certification for this facility during the public comment period for the revised permit. The draft CWA Certification materials can be found in Appendix D and E. Comments on the draft 401 certification

and its conditions should be sent to ADEC (see State Certification on Page 2 of this revised Fact Sheet).

D. Antidegradation

ADEC has conducted an antidegradation analysis of the discharge following its antidegradation policy and implementation methods outlined in 18 AAC 70.015 and 18 AAC 70.016, respectively. The antidegradation review is included in the draft 401 Certification for this permit and is included in Appendix E.

Comments regarding the CWA Section 401 Certification or antidegradation review can be submitted to ADEC (see State Certification on Page 2 of this revised Fact Sheet).

E. Permit Expiration

The permit will expire five years from the effective date.

VI. REFERENCES

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EPA. 2014. Water Quality Standards Handbook Chapter 5: General Policies. Environmental Protection Agency. Office of Water. EPA 820-B-14-004. September 2014. https://www.epa.gov/sites/production/files/2014-09/documents/handbook-chapter5.pdf

VII. APPENDIX A: WATER QUALITY DATA

A. Treatment Plant Effluent Data (2016-2021)

Parameter	BOD5, 20 deg. C (mg/L)	BOD5, 20 deg. C (mg/L)		BOD5 20 deg. C (lbs/day)		BOD5 (% removal)
Statistical Basis	INFLUENT	DAILY MAX	MO AVG	DAILY MX	MO AVG	Min % Removal
Average	92.53	18.42	18.42	44.75	44.75	77.56
Maximum	240.00	100.00	100.00	296.70	296.70	94.17
Minimum	32.00	8.40	8.40	17.35	17.35	28.50
Count	68.00	68.00	68.00	68.00	68.00	68.00
Std Dev	46.71	11.75	11.75	34.53	34.53	10.56
CV	0.50	0.64	0.64	0.77	0.77	0.14
99th Percentile	226.60	56.45	56.45	165.57	165.57	91.83
95th Percentile	185.50	33.55	33.55	77.34	77.34	89.69
5th Percentile	37.45	9.89	9.89	22.60	22.60	60.33

Parameter	TSS (mg/L)	TSS (mg/L)		TSS (lbs/day)		TSS (% removal)
Statistical Basis	INFLUENT	DAILY MX	MO AVG	DAILY MX	MO AVG	Min % Removal
Average	86.84	13.85	13.85	34.27	34.27	78.89
Maximum	280.00	48.00	48.00	99.17	99.17	96.70
Minimum	27.00	4.00	4.00	6.16	6.16	42.00
Count	68.00	68.00	68.00	68.00	68.00	68.00
Std Dev	48.56	6.43	6.43	16.78	16.78	12.02
CV	0.56	0.46	0.46	0.49	0.49	0.15
99th Percentile	239.80	35.27	35.27	81.89	81.89	96.10
95th Percentile	185.50	24.10	24.10	62.92	62.92	95.60
5th Percentile	32.90	4.84	4.84	12.03	12.03	59.04

Parameter	Fecal coliform, MPN, 44.5 C (#/100mL)		Flow (mgd)		Nitrogen, ammonia total [as N]	D.O. (mg/L)	
Statistical Basis	DAILY MX	MO GEO	DAILY MAX	MO AVG	DAILY MX	MAX	MIN
Average	14892.68	14892.68	0.69	0.35	13.07	7.95	5.00
Maximum	60000.00	60000.00	1.88	0.56	28.00	10.62	7.43
Minimum	72.00	72.00	0.26	0.21	4.40	5.21	2.67
Count	68.00	68.00	68.00	68.00	23.00	68.00	68.00
Std Dev	14639.29	14639.29	0.31	0.07	6.10	1.entero	0.97
CV	0.98	0.98	0.45	0.20	0.47	0.16	0.19
99th Percentile	58660.00	58660.00	1.88	0.52	27.12	10.59	7.32
95th Percentile	48300.00	48300.00	1.31	0.46	27.20	10.22	7.10
5th Percentile	394.00	394.00	0.34	0.24	4.48	5.81	3.60

Parameter	pH (S.U.)		Temp (C)
Statistical Basis	MAX	MIN	MO AVG
Average	7.56	7.09	10.22
Maximum	7.79	7.49	18.63
Minimum	6.95	6.50	2.17
Count	68.00	68.00	68.00
Std Dev	0.15	0.23	5.15
CV	0.02	0.03	0.50
99th Percentile	7.78	7.46	18.48
95th Percentile	7.75	7.40	17.96
5th Percentile	7.23	6.51	3.09

B. Receiving Water Data (2016-2021)

Parameter	Units	Percentile	Value	Source
Temperature	°C	95th	13.65	1
pH	Standard units	5th – 95th	6.0 – 8.0	1
Ammonia	mg/L	90th	0.214	1
Dissolved Oxygen	mg/L	Minimum	4.68	1
Turbidity	NTU	Average	12.8	1
Salinity	ppt	5th – 95th	3.1 – 28.6	1
Fecal Coliform	CFU	Max Geometric Mean	15.1	1
Copper	µg/L	Maximum	1.05	2

Source:
1) Data collected by permittee 2016-2021
2) Water Quality Measures in Alaska's Ports and Shipping Lanes, 2020 Annual Report

C. Alaska WQS Tables for Ammonia

Acute Ammonia Criteria, Marine

Total Ammonia in mg-N/L at 10 g/kg Salinity								
pH	Temperature							
	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
7.0	222.4	157.3	107.9	75.8	51.1	36.2	23.9	17.3
7.2	144.1	99.6	68.4	47.8	32.9	22.2	15.6	10.7
7.4	90.6	63.4	42.8	28.8	20.6	14.0	9.9	6.8
7.6	56.8	39.5	27.2	18.9	13.2	9.1	6.3	4.6
7.8	36.2	25.5	17.3	12.4	8.2	5.8	4.1	2.9
8.0	22.2	15.6	10.7	7.7	5.3	3.8	2.6	1.9
8.2	14.8	9.9	7.0	4.8	3.5	2.4	1.7	1.2
8.4	9.1	6.5	4.4	3.0	2.2	1.6	1.2	0.8
8.6	6.0	4.1	2.9	2.1	1.5	1.1	0.8	0.6
8.8	3.8	2.7	1.9	1.4	1.0	0.8	0.6	0.5
9.0	2.4	1.7	1.2	0.9	0.7	0.6	0.4	0.4

Chronic Ammonia Criteria, Marine

Total Ammonia in mg-N/L at 10 g/kg Salinity								
pH	Temperature							
	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
7.0	33.8	23.9	16.5	11.5	7.7	5.4	3.6	2.6
7.2	21.4	14.8	9.9	7.2	4.9	3.4	2.3	1.6
7.4	14.0	9.9	6.4	4.4	3.0	2.1	1.5	1.0
7.6	8.2	5.9	4.1	2.8	2.0	1.4	1.0	0.7
7.8	5.4	3.9	2.6	1.8	1.2	0.9	0.6	0.4
8.0	3.4	2.4	1.6	1.2	0.8	0.6	0.4	0.3
8.2	2.2	1.5	1.1	0.7	0.5	0.4	0.3	0.2
8.4	1.4	1.0	0.7	0.5	0.3	0.2	0.2	0.1
8.6	0.9	0.6	0.4	0.3	0.2	0.2	0.1	0.1
8.8	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.1
9.0	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1

VIII. APPENDIX B: REASONABLE POTENTIAL AND WQBEL FORMULAE

A. Reasonable Potential Analysis

EPA uses the process described in the 1991 TSD to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a WQBEL must be included in the permit.

1. Mass Balance

For discharges to flowing water bodies, the maximum projected receiving water concentration is determined using the following mass balance equation:

$$C_d Q_d = C_e Q_e + C_u Q_u \qquad \textit{Equation 1}$$

where,

C_d	=	Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone)
C_e	=	Maximum projected effluent concentration
C_u	=	95th percentile measured receiving water upstream concentration
Q_d	=	Receiving water flow rate downstream of the effluent discharge = Q_e+Q_u
Q_e	=	Effluent flow rate (set equal to the design flow of the WWTP)
Q_u	=	Receiving water low flow rate upstream of the discharge (1Q10, 7Q10 or 30B3)

When the mass balance equation is solved for C_d, it becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times Q_u}{Q_e + Q_u} \qquad \textit{Equation 2}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with 100% of the receiving stream.

If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times (Q_u \times \%MZ)}{Q_e + (Q_u \times \%MZ)} \qquad \textit{Equation 3}$$

Where:

% MZ = the percentage of the receiving water flow available for mixing.

If a mixing zone is not allowed, dilution is not considered when projecting the receiving water concentration and,

$$C_d = C_e \qquad \textit{Equation 4}$$

A dilution factor (D) can be introduced to describe the allowable mixing. Where the dilution factor is expressed as:

$$D = \frac{Q_e + Q_u \times \%MZ}{Q_e} \qquad \textit{Equation 5}$$

After the dilution factor simplification, the mass balance equation becomes:

$$C_d = \frac{C_e - C_u}{D} + C_u \qquad \textit{Equation 6}$$

If the criterion is expressed as dissolved metal, the effluent concentrations are measured in total recoverable metal and must be converted to dissolved metal as follows:

$$C_d = \frac{CF \times C_e - C_u}{D} + C_u \qquad \textit{Equation 7}$$

Where C_e is expressed as total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is a conversion factor used to convert between dissolved and total recoverable metal.

The above equations for C_d are the forms of the mass balance equation which were used to determine reasonable potential and calculate WLAs.

2. Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, the 1991 TSD recommends using the maximum projected effluent concentration (Ce) in the mass balance calculation (see equation 3, page C-5). To determine the maximum projected effluent concentration (Ce) EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter has been calculated, the reasonable potential multiplier (RPM) used to derive the maximum projected effluent concentration (Ce) can be calculated using the following equations:

First, the percentile represented by the highest reported concentration is calculated.

$$p_n = (1 - \text{confidence level})^{1/n} \qquad \textit{Equation 8}$$

where,

p_n = the percentile represented by the highest reported concentration

n = the number of samples

confidence level = 99% = 0.99

and

$$RPM = \frac{C_{99}}{C_{P_n}} = \frac{e^{Z_{99} \times \sigma - 0.5 \times \sigma^2}}{e^{Z_{P_n} \times \sigma - 0.5 \times \sigma^2}}$$ *Equation 9*

Where,

σ^2 = $\ln(CV^2 + 1)$

Z_{99} = 2.326 (z-score for the 99th percentile)

Z_{Pn} = z-score for the P_n percentile (inverse of the normal cumul distribution function at a given percentile)

CV = coefficient of variation (standard deviation ÷ mean)

The maximum projected effluent concentration is determined by simply multiplying the maximum reported effluent concentration by the RPM:

$$C_e = (RPM)(MRC)$$ *Equation 10*

where MRC = Maximum Reported Concentration.

3. Maximum Projected Effluent Concentration at the Edge of the Mixing Zone

   Once the maximum projected effluent concentration is calculated, the maximum projected effluent concentration at the edge of the acute and chronic mixing zones is calculated using the mass balance equations presented previously.

4. Reasonable Potential

   The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant.

B. WQBEL Calculations

1. Calculate the Wasteload Allocations (WLAs)

   WLAs are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis. To calculate the WLAs, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. Equation 6 is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u$$ *Equation 11*

Alaska's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR 122.45(c) requires that effluent limits be expressed as total recoverable metal. Therefore, EPA must calculate a WLA in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator, as shown in equation 12. The criteria translator (CT) is equal to the conversion factor, because site-specific translators are not available for this discharge.

$$C_e = WLA = \frac{D \times (C_d - C_u) + C_u}{CT} \qquad \textit{Equation 12}$$

The next step is to compute the "long term average" concentrations which will be protective of the WLAs. This is done using the following equations from the 1991 TSD:

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\,\sigma)} \qquad \textit{Equation 13}$$

$$LTA_c = WLA_c \times e^{(0.5\sigma_4^2 - z\sigma_4)} \qquad \textit{Equation 14}$$

where,

σ^2 = $\ln(CV^2 + 1)$

Z_{99} = 2.326 (z-score for the 99th percentile probability basis)

CV = coefficient of variation (standard deviation ÷ mean)

σ_4^2 = $\ln(CV^2/4 + 1)$

For ammonia, because the chronic criterion is based on a 30-day averaging period, the Chronic Long Term Average (LTAc) is calculated as follows:

$$LTA_c = WLA_c \times e^{(0.5\sigma_{30}^2 - z\sigma_{30})} \qquad \textit{Equation 15}$$

where,

σ_{30}^2 = $\ln(CV^2/30 + 1)$

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits as shown below.

2. Derive the maximum daily and average monthly effluent limits

Using the 1991 TSD equations, the MDL and AML effluent limits are calculated as follows:

$$\mathrm{MDL} = \mathrm{LTA} \times e^{(z_m\sigma - 0.5\sigma^2)} \qquad \textit{Equation 16}$$

$$\mathrm{AML} = \mathrm{LTA} \times e^{(z_a\sigma_n - 0.5\sigma_n^2)} \qquad \textit{Equation 17}$$

where σ, and σ^2 are defined as they are for the LTA equations above, and,

σ_n^2	=	$\ln(CV^2/n + 1$
z_a	=	1.645 (z-score for the 95th percentile probability basis)
z_m	=	2.326 (z-score for the 99th percentile probability basis)
n	=	number of sampling events required per month. With the exception of ammonia, if the AML is based on the LTA_c, i.e., $LTA_{minimum} = LTA_c$), the value of ''n'' should is set at a minimum of 4. For ammonia, In the case of ammonia, if the AML is based on the LTA_c, i.e., $LTA_{minimum} = LTA_c$), the value of ''n'' should is set at a minimum of 30.

IX. APPENDIX C: REASONABLE POTENTIAL AND WQBEL CALCULATIONS

Pollutant			AMMONIA, Criteria as Total NH3	Copper
Effluent Data	# of Samples (n)		23	3
	Coeff of Variation (Cv)		0.47	0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile)		28,000	51.2
	Calculated 50th percentile Effluent Conc. (when n>10)			
Mixing Zone Used	Aquatic Life – Acute		4.5	4.5
	Aquatic Life – Chronic		33	33
Receiving Water Data	90th Percentile Conc., µg/L		0.214	1.05
	Geo Mean, µg/L			
Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	7,700	4.8
		Chronic	1,200	3.1
	Human Health Water and Organism, µg/L		-	
	Human Health, Organism Only, µg/L		-	
	Metal Criteria Translator, decimal	Acute	-	0.83
		Chronic	-	0.83
	Carcinogen?		N	N
σ	$\sigma^2=\ln(CV^2+1)$		0.447	0.555
P_n	$=(1-\text{confidence level})^{1/n}$	99%	0.819	0.215
1991 TSD Multiplier	$=\exp(2.3262\sigma-0.5\sigma^2)/\exp(\text{invnorm}(P_{N)}\sigma-0.5\sigma^2)$	99%	1.9	5.6
53.9Max. effluent conc.(ug/L)		End of Pipe	52,722	288
Max. conc.(ug/L) at edge of…		Acute	11,716	53.9
		Chronic	1,598	8.3
Reasonable Potential? Limit Required?			YES	Uncertain*

n = # samples assumed to calculate AML			30	-
# of Compliance Samples Expected per month			4	-
LTA Coeff. Var. (CV), decimal	default = 0.6 or calculate from data		0.47	-
Permit Limit Coeff. Var. (CV), decimal			0.47	-
Waste Load Allocations ug/L	$C_d=(C_r x MZ_a)-C_{sa} x(MZ_a-1)$	Acute	34,649	-
	$C_d=(C_r x MZ_c)-C_{sc}*(MZ_c-1)$	Chronic	39,593	-
Long Term Averages ug/L	WLAc x $\exp(0.5\sigma^2-2.326\sigma)$	Acute	13,542	-
	WLAa x $\exp(0.5\sigma^2-2.326\sigma)$; ammonia n=30	Chronic	32,559	-
Limiting LTA, ug/L	used as basis for limits calculation		13,542	-
Metal Translator or 1?			-	-
Average Monthly Limit (AML), ug/L		95%	15,533	-
Maximum Daily Limit (MDL), ug/L		99%	34,649	-
Average Monthly Limit (AML), mg/L			15.5	-
Maximum Daily Limit (MDL), mg/L			34.6	-
Average Monthly Limit (AML), lb/day			78	-
Maximum Daily Limit (MDL), lb/day			173	-

*See the discussion on copper in Part IV.A.3 (pg. 32) of this Fact Sheet

X. APPENDIX D: DRAFT 401 CERTIFICATION

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DRAFT CERTIFICATE OF REASONABLE ASSURANCE

A Certificate of Reasonable Assurance, as required by Section 401 of the Clean Water Act, has been requested by the Environmental Protection Agency (EPA) for the marine water discharge of primary treated domestic wastewater from the City of Wrangell Wastewater Treatment Facility (WWTF).

The activity is located at 56.453298° north latitude, 132.391262° west longitude, near Wrangell, Alaska with discharges to Zimovia Strait.

Water Quality Certification is required for the activity because the activity will be authorized by an EPA permit identified as National Pollutant Discharge Elimination Permit No. AK0021466 and because a discharge will result from the activity.

Public notice of the application for this certification is made in accordance with 18 Alaska Administrative Code (AAC) 15.180. Public notice of the City of Wrangell's Antidegradation Form 2G, included as an attachment to this certification, is made in accordance with 18 AAC 70.016. In accordance with 18 AAC 70.016, *Antidegradation implementation methods for discharges authorized under the federal Clean Water Act*, the Alaska Department of Environmental Conservation (DEC or Department) reviewed the City of Wrangell's Antidegradation Form 2G and determined that the information provided by the City of Wrangell complies with the requirements of 18 AAC 70.016. DEC will accept comments on these documents during the public notice period.

DEC has completed its review of EPA's Draft National Pollutant Discharge Elimination Permit (NPDES) No. AK0021466 and associated documents and by means of this Draft Certificate of Reasonable Assurance conditionally certifies that there is reasonable assurance that the activity and the resulting proposed modified discharge from the Wrangell WWTF is compliant with the requirements of Section 401 of the Clean Water Act, 40 Code of Federal Regulations (CFR) 125.61, Alaska Statutes Title 46, and Alaska Water Quality Standards 18 AAC 70 provided that the proposed modified discharge adheres to the stipulations provided below in this certification. Furthermore, as per 40 CFR 125.64(b), the Department has determined that the proposed modified discharge will not result in an additional treatment pollution control or other requirement on any other point or nonpoint sources as Zimovia Strait is not included on DEC's 2022 Integrated Water Quality Monitoring and Assessment Report as an impaired waterbody nor is the subject portion of Zimovia Strait subject to a proposed or approved Total Maximum Daily Load.

A Final Certification of Reasonable Assurance is pending review of any public comments received and is contingent on the inclusion of the following stipulations in NPDES Permit No. AK0021466:

1. In accordance with 18 AAC 70.240, DEC authorizes mixing zones in Zimovia Strait for ammonia, dissolved oxygen, enterococcus bacteria, fecal coliform bacteria, and temperature contained in the discharge from the Wrangell WWTF. The mixing zones are defined as follows:

   The chronic mixing zone has a dilution of 33:1 and is defined as a rectangular area with a length of 29 meters and width of 73 meters centered over the diffuser with the length oriented parallel to the shoreline.

   The acute mixing zone has a dilution of 4.5:1 and is defined as a rectangular area with a length of 4.8 meters and width of 72 meters centered over the diffuser with the length oriented parallel to the shoreline.

   Rationale: In accordance with State Regulations 18 AAC 70.240, the department has authority to designate mixing zones in permits or certifications. The designated mixing zones will ensure that the most stringent water quality criteria for ammonia (acute 9.4 milligrams per liter (mg/L), chronic 1.4 mg/L), dissolved oxygen (6.0 mg/L daily minimum (surface for a depth of 1 meter, no less than 4 mg/L at any depth below the surface), 17 mg/L daily maximum, and temperature (15º Celsius) are met at all points outside of the mixing zone.

2. In order for the Wrangell WWTF to achieve compliance with the fecal coliform and enterococcus bacteria final effluent limits, DEC requires the establishment of a Compliance Schedule in the permit. Final effluent limits must be met as soon as possible, but no later than 5 years after the effective date of the permit. Interim requirements that will lead to compliance with the final effluent limits with dates for their achievement must be established in the permit. The following interim requirements shall be included in the Compliance Schedule:

   By one year after the effective date of the permit, the permittee shall develop a facility plan that evaluates alternatives to meet the final fecal coliform and enterococcus bacteria effluent limits and select their preferred alternative.

   By two years after the effective date of the permit, the permittee must complete the design of the preferred alternative and request approval to construct from DEC's Engineering Support and Plan Review (ESPR).

   By three years after the effective date of the permit, the permittee must secure funding and select a contractor to construct upgrades.

   By four years after the effective date of the permit, the permittee must commence construction.

   By five years after the effective date of the permit, the permittee must complete construction, complete optimization of facility upgrade operations, and achieve compliance with the final fecal coliform and enterococcus effluent limits. Final approval to operate must be requested from ESPR.

The permittee must submit progress or compliance reports on interim and final requirements no later than 14 days following the scheduled date of each requirement.

Rationale:
In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and all applicable criteria will be met.

According to 18 AAC 83.560, the Department has authority to specify a schedule of compliance leading to compliance with 33 U.S.C. 1251-1387 (Clean Water Act). Any schedule of compliance must require compliance as soon as possible, but no later than the applicable statutory deadline under 33 U.S.C. 1251-1387 (Clean Water Act). 18 AAC 83.560(b) requires interim requirements and dates for their achievement if the schedule of compliance exceeds one year from the date of permit issuance. Time between interim requirements must not exceed one year. Progress reports must be submitted no later than 14 days following each interim date and the final date of compliance.

According to 18 AAC 72.200, Application for department approval, (a) Except as otherwise provided in 18 AAC 72.035(d) and 18 AAC 72.200(b), a person must submit a plan to the department and obtain approval of that plan before constructing, installing, or modifying any part of a domestic wastewater collection, treatment, storage, or disposal system. To obtain approval, a person shall provide to the department the information required by 18 AAC 72.205. 18 AAC 72.240, states that the department will issue final approval to operate if the information required by 18 AAC 72.235 confirms that (A) the system was constructed as originally approved or (B) the system, or a designated phase of that system, otherwise meets the requirements of AS 46.03 and 18 AAC 72. DEC plan approval requirements will ensure that the most stringent water quality criteria for fecal coliform and enterococcus bacteria are met at all points outside the mixing zone.

3. DEC requires that the permit contain the following final fecal coliform effluent limits:

Monthly Average 200 fecal coliform per 100 mL (FC/100 mL)
Weekly Average 400 FC/100 mL
Daily Maximum 800 FC/100 mL.

Rationale:
In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and all applicable criteria will be met.

18 AAC 72.990(21) defines disinfect to treat by means of a chemical, physical, or other process such as chlorination, ozonation, application of ultraviolet light, or sterilization, designed to eliminate pathogenic organisms, and producing an effluent with a 30-day 200 FC/100 mL monthly average and a seven-day 400 FC/100 mL average. These limits are required as final fecal coliform limits. A daily maximum final effluent limit of 800 FC/100 mL limit is also required. Establishment of a daily maximum limit will help ensure compliance with water quality criteria. Since these limits are dependent on the use of specific technological processes, DEC applies these final fecal coliform bacteria effluent limits as technology-based limits. These final fecal coliform bacteria effluent limits will ensure that the most stringent water quality criteria for fecal coliform bacteria are met at all points outside the mixing zone.

4. DEC requires that based on the chronic dilution of the driving parameter of the mixing zone (ammonia, with a chronic dilution of 33:1), the permit contain the following final enterococcus bacteria limits:

   30-day Geometric Mean 1,155 colony forming unit (CFU)/100 mL
   Daily Maximum 4,290 CFU/100 mL).

   <u>Rationale</u>:
   In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and all applicable criteria will be met.

   These final enterococcus bacteria limits will ensure that the most stringent water quality criteria for enterococcus bacteria are met at all points outside the mixing zone. DEC expects that after the implementation of disinfection, the Wrangell WWTF may achieve compliance with enterococcus water quality criteria (30-day geometric mean 35 CFU/100 mL with not more than 10% of the samples exceeding a statistical threshold value of 130 CFU/100 mL), therefore these final enterococcus bacteria limits may be revised in the next permit reissuance.

5. DEC requires the following ammonia effluent limits:

   Average Monthly 22 mg/L
   Daily Maximum 42 mg/L

   <u>Rationale</u>:
   18 AAC 70.240(b)(2) requires the Department to consider the characteristics of the effluent after treatment of the wastewater. Additionally, 18 AAC 83.435(d) specifies that when the Department determines, using the procedures in 18 AAC 83.435(c), that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the

allowable ambient concentration of a state numeric criteria within a state water quality standard for and individual permit, the permit must contain effluent limits for that pollutant.

DEC used the process described in the Technical Support Document (TSD) for Water Quality-Based Toxics Control (Environmental Protection Agency, 1991) and DEC's guidance, Alaska Pollutant Discharge Elimination System Permits Reasonable Potential Analysis and Effluent Limits Development Guide (June 30, 2014) to determine the reasonable potential for ammonia to exceed water quality criteria. The results of the reasonable potential analysis indicated that ammonia with a maximum expected concentration of 33 mg/L, has reasonable potential to exceed Alaska ammonia marine water quality criteria (chronic 1.4 mg/L, acute 9.4 mg/L) which were calculated using the 85th percentile receiving water pH and temperature and the 15th percentile receiving water salinity. Effluent limits, using the available dilution for ammonia were therefore developed (average monthly 22 mg/L, daily maximum 42 mg/L). These effluent limits will ensure that the most stringent ammonia water quality criteria are met at all points outside the mixing zone.

DRAFT	DRAFT
Signature	Date
DRAFT	DRAFT

XI. APPENDIX E: ANTIDEGREDATION REVIEW

Antidegradation Form 2G

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION (DEC)
Wastewater Discharge Authorization Program
555 Cordova Street, AK 99501
907-269-6285

Form 2G must be completed by all applicants. The applicant shall submit sufficient information for the department to complete an antidegradation analysis and make findings under 18 AAC 70.016 (b), (c), and (d). DEC may request additional information as necessary.

Antidegradation analysis is tier-specific and the department findings for Tier 1 and Tier 2 are on a parameter-by-parameter basis. Analysis and department findings for Tier 3 water are on a basis of a designated water.

The antidegradation review procedure is based on:

- The level of protection (i.e. Tier 1, 2, or 3) assigned to the pollutants of concern within the receiving water,
- The type of receiving water,
- Existing water quality of the receiving water,
- The necessity of degradation, and
- The social and economic importance of the regulated activity.

All discharges that require a permit under 18 AAC 83 Alaska Pollutant Discharge Elimination System (APDES) or an application for state certification of a federal permit under Section 401 of the Clean Water Act (CWA) are subject to antidegradation regulatory requirements under 18 AAC 70.016. [18 AAC 70.016(a)(1)(A & B)]

Submit completed form to DEC Division of Water to the address above, or via email to either of the following email addresses depending on the type of permit:

- 401 Certification for 404 CWA, or other federal permits: DEC-401Cert@alaska.gov
- APDES Permits: DEC.Water.WQPermit@alaska.gov
- Or, via other means as coordinated with DEC Division of Water.

Section 1- Facility Information [18 AAC 70.016(a)(5)(A – G)]

Facility Name: City of Wrangell Wastewater Treatment Plant **Permit Number**: AK0021466

1. Provide a list of Parameters of Concern in the discharge, the respective concentrations, persistence, and potential impacts to the receiving water.
2. Identify which Tier protection level should apply for each Parameter of Concern.

(For multiple parameters or if additional space is needed, attach separate sheet)

Receiving Waterbody or Wetland:

Zimovia Strait

Parameter of Concern:	Respective Concentrations:	Tier* Protection Level: *(*Note, complete this entry after completing the rest of the form)*
Ammonia, Fecal Coliform, Total Residual Chlorine (TRC)	28 mg-N/L, 60,000 col/100 mL, 100 µg/L	Tier 2

Persistence:

Ammonia has been tested 18 times between 2018-2022 as required by the current permit. The concentrations ranged from 3.3 to 28 mg-N/L and is a parameter that is typically found in wastewater discharge. Fecal coliform is consistently discharged from the WWTP with geometric means ranging from 72 to 60,000 col/100 mL. TRC was only required to be monitored in the current permit if disinfection was used. TRC data has not been collected.

Potential Impacts:

High concentrations of ammonia present in water bodies can cause aquatic organisms to not efficiently excrete ammonia, which leads to a toxic buildup in internal tissues and blood, and potentially death. The maximum concentration tested in the WWTP effluent was 28 mg-N/L which is over the AWQS. However, samples collected in the receiving waterbody at four (4) stations from 2018-2022 had concentrations ranging from non-detect to 0.21 mg-N/L.

Fecal coliform, found in human and animal feces, is used to indicate possible presence of disease-causing bacteria. Based on samples have been collected in the receiving waterbody at locations required by the current permit concentrations of fecal coliform have ranged from non-detect to 280 col/100 mL. The highest concentration was collected in May 2019 at Station 1. As described in the mixing zone Form 2-M and associated attachment, it is assumed that bacteria (fecal coliform, enterococcus) will be substantially reduced from current levels due to ADEC's determination that disinfection standards (18 AAC 72) will have to be met by the facility, which are 200 cfu/100 mL (average) applied at end of pipe. At these disinfection-reduced levels, bacteria will still need a mixing zone but the dilution and size needed will be controlled by other parameters.

TRC concentrations do not typically persist for long periods of time, but can potentially impact that microbial, fungi, and biofilm habitats in habitats in which it is discharged into. The WWTP has had a permit limit of 100 µg/L in the event that disinfection took place. There have been no samples collected of TRC.

If applicable, data is attached on the parameters that may alter the effects of the discharge to the receiving water. ☐ Yes, ☐ No, ☑ N/A

Section 2- Baseline Water Quality Provisions [18 AAC 70.016(a)(6)(A – C)]

If determined necessary and requested by the Department, submit sufficient and credible baseline water quality information for the receiving water which meets the requirements of 18 AAC 70.016(a)(6)(A – C).

Section 3- Tier 1 Protection Level and Analysis [18 AAC 70.016(b)]

1. Does a discharge of any parameter identified in Section 1 occur to a Category 4 [305(b)] or Category 5 [303(d)] waterbody listed in the current approved Alaska's Integrated Water Quality Monitoring and Assessment Report?

See http://dec.alaska.gov/water/water-quality/impaired-waters.aspx for the most recently approved integrated report and category listings.

☐ Yes ☑ No

a. If yes, list parameters from Section 1 that are present in the proposed discharge that will be included in the Tier 1 analysis in the following table.

Receiving Water and Wetlands Information (if additional space is needed, attach separate sheet):

a. Name of waterbodies or wetlands to which you discharge:	**Impaired Waters**					
	b. Is the proposed discharge(s) directly to any segment of a Category 4 or 5 waterbody?		If you answered yes to b, then answer the following three questions (c, d, and e).			
			c. What parameter(s) are causing the Category 4 or 5 water degradation?	**d**. Are the parameter(s) causing the degradation present in the proposed discharge?		**e**. Is the discharge consistent with the assumptions and requirements of applicable EPA approved or established Total Maximum Daily Load (TMDL)?
	Yes	No		Yes	No	Yes	No
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐

Section 4- Tier 2 Protection Level and Analysis [18 AAC 70.016(c)]

If not identified as requiring only Tier 1 level of protection, Tier 2 is presumed for all water as the default protection level for all parameters [18 AAC 70.016(c)(1)].

1. Is the application for a *(Check all that apply)*:

☐ New Discharge* ☐ Existing Discharge ☑ Expanded Discharge*

*Note: "new or expanded," with respect to discharges means discharges that are regulated for the first time or discharges that are expanded such that they could result in an increase in permitted parameter load or concentration or other changes in discharge characteristics that could lower water quality or have other adverse environmental impacts.

2. Does a discharge of any parameter identified in Section 1 – Facility Information require Tier 2 analysis as defined under 18 AAC 70.016(c)(2)(A) – (E)?

☑ **Yes**, proceed to **Question 3**

☐ **No**, please **explain below** and proceed to **Section 5**

3. For each parameter requiring a Tier 2 analysis, provide a description per discharge (e.g., parameter specific per outfall) and analysis of a range of practicable alternatives that have the potential to prevent or lessen the degradation associated with the proposed discharge [18 AAC 70.016(c)(4)] (*if additional space is needed, attach separate sheet*). Include:

A. Identification of receiving water quality and accompanying environmental impacts on the receiving water for each of the practicable alternatives;

See Supplemental Attachment

B. Evaluation of the cost for each of the practicable alternatives, relative to the degree of water quality degradation;

See Supplemental Attachment

C. Identification of a proposed practicable alternative that prevents or lessens water quality degradation while also considering accompanying cross-media environmental impacts. (*If the applicant has selected a non-degrading alternative, the social or economic importance analysis in Question 4 is not required.*

See Supplemental Attachment

4. Social or Economic Importance [18 AAC 70.016(c)(5)]

Provide information that demonstrates the accommodation of important social or economic development. The applicant shall complete either a social OR economic importance analysis (or both) identifying each affected community in the area where the receiving water for the proposed discharge is located. *(if additional space is needed, attach separate sheet)*

(A) Social Importance Analysis: *(select one or more areas, and describe below)*	**(B) Economic Importance Analysis**: *(select one or more areas, and describe below)*:
☑ community services provided; ☑ public health or safety improvements; ☑ infrastructure improvements; ☑ education and training; ☐ cultural amenities; ☐ recreational opportunities	☑ employment, job availability, and salary impacts; ☐ tax base impacts; ☐ expanded leases and royalties; ☐ commercial activities; ☐ access to resources; ☐ access to a transportation network

Describe (checked items above or attach as separate document)

See Supplemental Attachment

Section 5- Tier 3 Protection Level and Analysis [18 AAC 70.016(d)]

1. Is the discharge to a designated Tier 3 water? ☐ Yes ☑ No

(Currently, the State of Alaska has not designated any Tier 3 waters).

See http://dec.alaska.gov/water/water-quality/standards/antidegradation.aspx for Tier 3 for further information.)

Section 6. Certification Information

An Alaska Pollutant Discharge Elimination System (APDES) permit application must be signed by an individual with the appropriate authority per 18 AAC 83.385 or for 401 certification of 404 permits or other federal permits per 18 AAC 15.030.

APDES Permits	
Corporate Executive Officer 18 AAC 83.385 (a)(1)(A)	For a corporation, a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation.
Corporate Operations Manager 18 AAC 83.385 (a)(1)(B)	For a corporation, the manager of one or more manufacturing, production, or operating facilities, if (i) the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations; (ii) the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and (iii) authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
Sole Proprietor or General Partner 18 AAC 83.385 (a)(2)	For a partnership or sole proprietorship, the general partner or the proprietor respectively.
Public Agency, Chief Executive Officer 18 AAC 83.385 (a)(3)(A)	For a municipality, state, or other public agency, the chief executive officer of the agency.
Public Agency, Senior Executive Officer 18 AAC 83.385 (a)(3)(B)	For a municipality, state, or other public agency, a senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.
401 Certifications	
Corporations 18 AAC 15.030(1)	In the case of corporations, by a principal executive officer of at least the level of vice president or his duly authorized representative, if the representative is responsible for the overall management of the project or operation.
Partnerships 18 AAC 15.030(2)	in the case of a partnership, by a general partner
Proprietorship 18 AAC 15.030(3)	in the case of a sole proprietorship, by the proprietor
Public Agency 18 AAC 15.030(4)	in the case of a municipal, state, federal or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Organization:	Name:	Title:
City and Borough of Wrangell	Tom Wetor	Public Works Director

Phone:	Fax (optional):	Email:
907-874-3904		twetor@wrangell.com

Mailing Address:	Street (PO Box):		
	P.O. Box 531		
	City:	State:	Zip:
	Wrangell	AK	99929

Thomas Wetor

Signature/Responsible Official

4/25/2023

Date

Section 7. Form 2G Preparer *(Complete if Form 2G was prepared by someone other than the certifier.)*

Organization:	Name:	Title:
HDR Engineering, Inc	Tom Dupuis	Senior Water Quality Engineer

Phone:	Fax (optional):	Email:
208-890-0464		thomas.dupuis@hdrinc.com

Mailing Address: ☐ Check if same as Certifiers Information	Street (PO Box):		
	582 E. 36th Avenue Suite 500		
	City:	State:	Zip:
	Anchorage	Alaska	99503

Form 2G Supplemental Attachment

Section 4-Tier 2 Protection Level and Analysis

The City of Wrangell effluent data indicates that ammonia is a pollutant of concern that will need a mixing zone to meet marine water quality standards. Additional treatment is the only potential practicable alternative for ammonia to further reduce concentrations in the wastewater treatment plant (WWTP) which would involve secondary treatment (nitrification).

It is also Wrangell's understanding that fecal coliform concentrations will be addressed by Alaska Department of Environmental Conservation (ADEC) as a technology based effluent limitation (TBEL) as described in 18 AAC 72. Additional treatment is the only potential practicable alternative for fecal coliform to further reduce concentrations in the effluent. The treatment alternatives include disinfection at the WWTP.

Without additional treatment, concentrations of ammonia and fecal coliform in the effluent are expected to be similar to historical values and are unlikely to impact the existing water quality of Zimovia Strait. The continued use of a multi-port diffuser will provide dilution sufficient to achieve water quality standards and avoid degradation of the receiving waterbody beyond the zone of initial dilution (ZID).

Wrangell will need to complete an analysis to determine the type of disinfection and the process it will institute for determining the best treatment solution (i.e., ultraviolet disinfection or chlorine) in order to have the disinfection process meet the new permit limits (TBELs). The TBELs for fecal coliform will reduce fecal coliform concentrations from the current levels once disinfection is implemented at the WWTF.

If chlorination is chosen for disinfection, then a dechlorination system would be required to remove total residual chlorine (TRC) from the effluent before discharge to Zimovia Strait.

It is Wrangell's understanding that there will be a compliance schedule and interim limits that will allow the WWTP the time needed to meet the new permit limits.

3A-Identification of Receiving Water Quality and Accompanying Environmental Impacts for Each Practicable Alternative

Wrangell has conducted receiving waterbody monitoring as part of the current discharge permit which has included water quality monitoring, fecal coliform testing and biological monitoring including sediment and benthic infauna sampling. Based on the results of this monitoring program the habitat of the receiving waterbody has not been impacted by the discharge of the effluent from the WWTP.

The practicable alternative of additional treatment for the WWTP would include secondary treatment (nitrification) and installation of ultraviolet disinfection or chlorination disinfection for fecal coliform. Impacts to Zimovia Strait for this alternative would include a decrease in the concentrations of both ammonia and fecal coliform. If chlorine disinfection were chosen, there would likely be the introduction of some total residual chlorine from the disinfection process, but

this would be monitored and if determined to be necessary based on analysis, a dechlorination system would be installed to meet the permit limit at the WWTP.

3B. Evaluation of the cost for each of the practicable alternatives, relative to the degree of water quality degradation

The cost of installing and operating the various treatment systems at the WWTP include the cost of the building improvements and/or construction required, and additional mechanical equipment, piping and chemicals. The analysis and cost of treatment for each parameter are provided as follows:

Cost for WWTP Improvements to Remove Ammonia

The existing WWTP is currently a primary treatment facility utilizing a primary clarification process to meet the discharge requirements of their NPDES permit/301(h) waiver. The WWTP includes influent pumping, influent mechanical screening, an aeration basin, sedimentation basin, and lab facilities/offices.

Influent wastewater is pumped via a force main to an influent mechanical screen. Screened wastewater then flows into an aeration basin that has a detention time of six days. Aeration is provided by fine bubble membrane diffusers that are attached to floating aeration chains which are moved across the basin by the air released from the diffusers. The wastewater then moves through a settling basin that has a detention time of two days. The effluent then leaves the settling basin via gravity flowing through the outfall into Zimovia Strait. Sludge from the settling basin is removed on a ten-year cycle by contracting sludge dewatering services. The service dewaters, adds lime and/or heat treat the sludge to create a Class A material. The material is then used as fertilizer on the local golf course or on other local lands.

Potential ammonia limits required to be met without a mixing zone would be restrictive and Wrangell's plant would need to make significant changes to the treatment process in order to achieve adequate nitrification for ammonia removal. A new mechanical, secondary treatment facility utilizing a conventional activated sludge process requires regular maintenance, advanced training for operational staff, and would be more operationally difficult to maintain than the current primary facility. Upgrading the existing primary plant to an activated sludge process (that can achieve nitrification) would generally require the addition of anoxic/aerobic bioreactors, secondary clarification, return activated sludge (RAS) pumping, and waste activated sludge (WAS) pumping to the aerobic digester for sludge stabilization and dewatering. For the purposes of this anti-degradation analysis, the two practicable alternatives that have been determined are a conventional activated sludge treatment system and a Membrane Bioreactor (MBR) treatment system have been assumed for plant upgrades to meet the potential low effluent ammonia limits. These alternatives would generally include upgraded influent fine screens, grit removal, anoxic/aerobic reactors and secondary clarifiers or membranes bioreactors for secondary solids separation, RAS and WAS pumping, solids thickening, aerobic digestion and solids dewatering.

Table 1 provides a rough order of magnitude (ROM) opinion of probable cost for the development of ammonia removal processes at the WWTP using MBR. It is assumed that a

separate building/structure would have to be constructed to house the treatment systems to have room on-site for the new facilities.

Table 1: Opinion of Probable Cost, MBR WWTP Treatment Process

Item	Quantity	Units	Unit Cost	Cost
New Equipment				
- Headworks improvements (screening, grit, etc.)	1	LS	$2,500,000	$2,500,000
- MBR (tanks, chemical systems, etc.)	1	LS	$2,822,000	$2,822,000
- Process pumps	1	LS	$150,000	$150,000
- Concrete basins	1	LS	$1,494,000	$1,494,000
- Process Piping	1	LS	$750,000	$750,000
- Solids Handling improvements	1	LS	$1,250,000	$1,250,000
- Ancillary equipment/systems	1	LS	$1,720,000	$1,720,000
New Building				
Additional Treatment Building (Structure and Mech)	5,200	SF	$800	$4,160,000
Misc Concrete and structures	1	LS	$860,000	$860,000
Site Work (excavation, grading, etc.)	1	LS	$2,150,000	$2,150,000
	Subtotal			**$17,856,000**
	Contingency (25%)			$4,464,000
	Electrical, Instrumentation, and Control (25%)			$4,464,000
	Engineering and Construction Management (20%)			$3,571,200
	City/Borough Administration and Legal (5%)			$892,800
	Operations (new FTEs in Utility Dept)			$380,000
	Total			**$31,628,000**

Table 2 provides a ROM opinion of probable cost for the development of ammonia removal processes at the WWTP using conventional activated sludge system. It is also assumed that a separate building/structure would have to be constructed to house the treatment systems to have room on-site for the new facilities.

Table 2: Opinion of Probable Cost, Conventional Activated Sludge WWTP Treatment Process

Item	Quantity	Units	Unit Cost	Cost
New Equipment				
- Headworks improvements (screening, grit, etc.)	1	LS	$2,500,000	$2,500,000
- Anoxic/Aerobic Bioreactors (tanks, chemical systems, etc.)	1	LS	$2,158,000	$2,158,000
- Clarifiers (including WAS Vault and Splitter Box)	1	LS	$4,050,400	$4,050,400
- Process pumps	1	LS	$415,000	$415,000
- Process Piping	1	LS	$750,000	$750,000
- Solids Handling improvements	1	LS	$1,250,000	$1,250,000
- Ancillary equipment/systems	1	LS	$1,720,000	$1,720,000
New Building				
Additional Treatment Building (Structure and Mech)	5,200	SF	$800	$4,160,000
Misc Concrete and structures	1	LS	$860,000	$860,000
Site Work (excavation, grading, etc.)	1	LS	$2,150,000	$2,150,000
	Subtotal			**$20,013,400**
	Contingency (25%)			$5,003,350
	Electrical, Instrumentation, and Control (25%)			$5,003,350
	Engineering and Construction Management (20%)			$4,002,680
	Borough Administration and Legal (5%)			$1,000,670
	Operations (new FTEs in Utility Dept)			$380,000
	Total			**$35,403,450**

Cost for WWTP Disinfection Improvements

To meet the potential technology-based, end-of-pipe permit limits for fecal coliform and enterococcus (18-AAC-72 technology basis), a new disinfection system would be required at the WWTP. If Wrangell continues the use of primary clarification without secondary treatment (nitrification) for ammonia then ultraviolet (UV) disinfection system would not be a viable alternative based on the treated effluent. If secondary treatment is provided, then ultraviolet disinfection should be compared to chlorine disinfection in a preliminary alternatives analysis and cost comparison.

For the purposes of this analysis, the use of sodium hypochlorite has been assumed for plant effluent disinfection. There are a number of potential alternatives to consider for a chlorine disinfection system including on-site generation versus storage, tote versus mini-bulk versus bulk storage of commercial hypochlorite, chemical transfer and metering pumping, chlorine contact basin versus pipeline for detention, etc. A detailed preliminary engineering evaluation

should be performed, taking into account capital costs, as well as life cycle costs, chemical delivery, facility footprint, and sensitivity to power costs and hypochlorite production costs before selecting the most viable alternative for the Wrangell WWTP. If it is determined that chlorination is the best alternative for Wrangell then, it is likely that dechlorination processes will be necessary to minimize the effects of potentially toxic chlorine residuals on the environment. As with a chlorination system, there are a number of potential alternatives to consider for a dechlorination system; which generally include reacting the residual chlorine with a reducing agent or by adsorption on and reaction with activated carbon. For the purposes of this conceptual analysis, the use of sodium bisulfite has been assumed for dechlorination. Sodium bisulfite would be injected in the disinfection channel to neutralize any chlorine remaining after the disinfection process is complete and would have a similar metering pump system and chemical storage requirements.

Table 3 provides a ROM opinion of probable cost for the development of chlorine disinfection and assumes on-site generation at the facility, associated ancillary equipment, and the construction of a concrete chlorine contact basin to achieve adequate detention time prior to discharge. It is assumed that a separate building/structure would have to be constructed to house the treatment systems.

Table 3: Opinion of Probable Cost, WWTP Treatment Process for Disinfection

Item	Quantity	Units	Unit Cost	Cost
General Requirements (Contractor, Sales Tax, Mob/De-mob)	1	LS	$1,640,000	$1,640,000
Site Work (excavation, grading, etc.)	1	LS	$450,000	$450,000
Concrete (containment and diversion walls, bases, suspended walls, etc.)	1	LS	$343,000	$343,000
Miscellaneous Metals, Woods, and Plastics	1	LS	$100,000	$100,000
Painting and Protective Coatings	1	LS	$30,000	$30,000
New Equipment (Onsite Gen of Hypochlorite 0.8% System)	1	LS	$890,000	$890,000
-Hypochlorite Induction Unit				
-Hypochlorite Storage Tanks				
-Onsite Generation System				
-Sump Pumps				
Dechlorination system (metering pumps, containment, etc.)	1	LS	$360,000	$360,000
Process Piping	1	LS	$400,000	$400,000
New Building				
Additional Treatment Building (Structure and Mech)	1,800	SF	$800	$1,440,000
Identification, Stenciling, and Tagging System, Package Scrubber, Emergency Eye Wash Stations	1	LS	$95,000	$95,000
Electrical	1	LS	$935,000	$935,000
	Subtotal			**$7,448,000**

Contingency (30%)	$ 2,234,400
Contractor or Owner change during Construction (10%)	$ 744,800
Engineering and Construction Management (20%)	$ 1,489,600
Borough Administration and Legal (5%)	$ 372,400
Operations (new FTEs in Utility Dept)	$285,000
Total	**$ 12,574,200**

The Class 5 (rough order of magnitude) opinions of probable cost (OPCC) for the development of treatment processes at the WWTP include estimated construction dollars, contingencies, administration, and engineering fees. Construction costs are based on conceptual alternatives. The costs have been estimated based on information from cost estimating guides and experience gained while designing similar facilities and does not include cost inflation, cost increases due to supply-chain shortages, and other factors that are unknown at the time the estimate was created.

Preliminary cost estimates include the costs to construct the improvements as well as a number of additional factors, including an allowance for the contractor's overhead and profit and mobilization/demobilization costs. The OPCC includes capital costs of the conceptual level alternatives to provide a planning-level comparison and an indication of the significant capital expenditure that would be required to construct such facilities. The cost estimates do not provide a life-cycle cost analysis of long-term impacts to Wrangell. On top of an overall increased operational complexity for more advanced treatment processes, long term costs for chemical addition, energy usage, and additional maintenance requirements would result in a significant annual O&M cost increase.

Before Wrangell considers moving ahead with any of the options put forth in this memorandum, HDR suggests a comprehensive alternatives analysis and financial evaluation of the wastewater treatment methods/alternatives, coupled with a detailed determination of how final WWTP effluent permit requirements can be met.

Overall, the only alternative for the WWTP is to further treat ammonia and fecal coliform at a cost that would range from $43-$47 million dollars.

With an authorized mixing zone, there are still costs associated with disinfection in order to meet the ADEC TBEL fecal coliform permit limits which as shown above is approximately twelve million dollars.

3C. Identification of Proposed Practicable Alternative that Prevents or Lessens Water Quality Degradation

The most practicable alternatives have been evaluated in the sections above. These are the only practicable alternatives that can be considered for reducing ammonia and fecal coliform in the effluent at the Wrangell WWTP. Overall costs to treat for the two parameters listed would range between $43 to $47 million.

4. Social and Economic Importance

Wastewater treatment facilities are important in providing communities social and economic development growth opportunities. It has been well documented that wastewater infrastructure is beneficial for the people within the community that they serve, the environment, and the economies in both the short and long term. Wastewater infrastructure investment is crucial in achieving and maintaining public health, improving the environment, and enhancing the quality of life. Wastewater collection and treatment is essential to preventing disease and protecting human health. Wrangell has provided these services at the WWTP in the current process configuration since 2001 and well before, which has allowed for stable population and economic growth in the area.

The existing WWTP is currently permitted for a monthly average flow of 0.6 MGD and a daily maximum flow of 3.0 MGD. The average flows to the WWTF from 2018-2022 have been approximately 0.5 MGD with the highest maximum daily flow at 1.88 MGD. This shows that Wrangell can continue to operate under the existing permitted flow rates or expand the WWTP to accommodate additional growth/flow. Based on the receiving water monitoring that has been conducted as part of Wrangell's discharge permit the existing primary treatment being conducted at the WWTP does not adversely impact aquatic life or the overall health of Zimovia Strait.

The WWTP currently employs 1.5 full time employees. In a small community these positions help provide economic stability to a number of residents. The WWTP also provides community services and associated infrastructure improvement for 1,150 service connections. Wrangell provides education and training to staff. The WWTP also has provided public tours of the facilities.

The social and economic impacts of not authorizing a mixing zone should be considered. The capital and on-going operation and maintenance costs associated with additional treatment alternatives discussed in previous sections would have significant impact on Wrangell and the customer base that fund the operation of the community utilities. Large increases in sewer rates to fund improvements and on-going operations could negatively impact the quality of life and make the region less attractive to individuals and companies looking to move or grow in the area.

If the WWTP were to be required to add additional treatment due to losing the mixing zone, not only would the costs of building in the additional treatment processes as discussed in previous sections be required, but Wrangell would also incur long term operational and maintenance

costs. For example, additional operators with higher levels of operator certifications to operate the more complex facility would need to be hired. Small communities in Alaska have an extreme level of difficulty in finding and retaining qualified operators to run more complex treatment facilities.